



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/750,583	12/31/2003	Hong Jiang	ITL1704US (P17510)	8582
21906 7590 09/30/2008 TROP PRUNER & HU, PC 1616 S. VOSS ROAD, SUITE 750 HOUSTON, TX 77057-2631				
EXAMINER WALERIC CHARLES				
ART UNIT		PAPER NUMBER		
2195				
MAIL DATE		DELIVERY MODE		
09/30/2008		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/750,583

Applicant(s)

JIANG ET AL.

Examiner

ERIC C. WAI

Art Unit

2195

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 July 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3 and 6-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,6-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/CDC)
- Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. Claims 1, 3, and 6-21 are presented for examination.

Double Patenting

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claims 1, 3, and 6-21 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-5, 12-13, 19-22, 26-27, and 33-34 of copending Application No. 10/750,589. Although the conflicting claims are not identical, they are not patentably distinct from each other.
4. For example, claim 1 of copending Application No. 10/750,589 recites placing a thread in an inactive state in response to a predetermined condition and sending a

message from a semaphore to change the state of the thread. Claim 11 of the present application performs the substantially the same steps. Claim 1 of copending Application No. 10/750,589 differs only in that the threads are intended to be used to process graphical elements of an image. It would have been obvious to one of ordinary skill to try to extend the teachings to image processing.

5. This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1, 3, and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Wang et al. (US Pat No. 5,771,382).

8. Regarding claim 1, Wang teaches a method comprising:

placing an executable thread of instructions in an inactive state in response to a resource being unavailable (col 6 lines 61-63, wherein threads that do not have access to the resource are directed to a wait state; col 8 lines 1-19, wherein an embodiment of the wait state includes putting the thread to sleep); and

when the resource becomes available, changing the thread of instructions to the active state and granting the resource to the thread of instructions (col 6 lines 63-65).

9. Regarding claim 3, Wang teaches executing the thread of instructions when in the active state (col 8 lines 60-62).

10. Regarding claim 6, Wang teaches maintaining an indication of a state of each of a plurality of executable threads of instructions (col 6 lines 61-65, wherein it is inherent that Wang maintains an indication on the state of each thread in order to change them from the wait state).

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wang et al. (US Pat No. 5,771,382).

13. Regarding claim 7, Wang does not teach that the indication of the state of each thread comprises a state variable corresponding to a dependency, if any, of an associated thread.

14. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Wang to include a state variable corresponding to a dependency of an associated thread. Wang teaches that each thread is dependent on the use of the semaphore/resource for operation. Wang also teaches the need to synchronize communications among threads (col 2 lines 33-34). One would be motivated by the desire to prohibit out of order accesses to resources that could cause system conflicts.

15. Claims 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kwok et al. (US Pat No. 5,951,672 hereinafter Kwok) in view of Wenniger (US Pat No. 6,018,785).

16. Kwok was cited in the last office action. Wenniger was disclosed in IDS dated 3/31/2005

17. Regarding claim 8, Kwok teaches an apparatus comprising:
execution means for placing an executable thread of instructions in an inactive state in response to detection of at least one of a set of predetermined conditions (col 4 lines 35-44, wherein the first thread is in a waiting state after testing variables linking the two threads);

means for resuming execution of the first thread of instructions in response to the semaphore entity (col 4 lines 35-44, wherein the task is executed).

18. Kwok does not teach communication means for sending a message from a semaphore to control circuitry to execute the thread of instructions to change a state of the thread of instructions from the inactive state. However, Wenniger teaches using an active semaphore to generate an interrupt signal whenever a semaphore status changes (col 6 lines 1-22). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Kwok to use an active semaphore. One would be motivated by the desire to reduce unnecessary resource usage caused by continuous polling of passive semaphores as indicated by Wenniger (col 6 lines 10-12).

19. Regarding claim 9, Kwok teaches maintaining an indication of a state of each of a plurality of executable threads of instructions (col 4 lines 1-11, wherein state variables for each thread are consulted).

20. Regarding claim 10, Kwok teaches that the indication of the state of each thread comprises a state variable corresponding to a dependency, if any, of an associated thread (col 4 lines 1-11, wherein state variables for each thread are consulted).

21. Claims 11-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wenniger (US Pat No. 6,018,785).

22. Regarding claim 11, Wenniger teaches an apparatus comprising:

an execution circuit to receive and execute a thread of instructions, wherein the execution circuit transmits a semaphore request message and places the thread in an inactive state in response to the thread of instructions requiring a resource having an associated semaphore (col 6 lines 12-22, wherein the requesting process must await an interrupt from the semaphore); and

a semaphore entity coupled with the execution circuit to receive the semaphore request message from the execution circuit and to selectively grant control of the semaphore in response to the semaphore request message by transmitting a semaphore acknowledge message to the execution circuitry, wherein the execution circuitry, in response to receiving the semaphore acknowledge message, removes the thread of instructions from the inactive state and grants the resource to the thread when the resource becomes available (col 6 lines 12-22, where upon receiving the interrupt, the thread queries the semaphore; col 6 lines 40-42, wherein the resource is granted).

23. Wenniger does not explicitly teach that the thread of instructions is placed in an inactive state. Wenniger only teaches that the thread awaits the interrupt from the hardware semaphore. However, it would have been obvious to one of ordinary skill in the art at the time of the invention, that the thread would be placed in an inactive state. It is well known in the art that threads are stalled when the resources that they require are unavailable. One would be motivated by the desire to reduce idle execution time of threads awaiting resources as is well known in the art.

24. Regarding claim 12, Wenniger does not teach further comprising: at least one additional execution circuit to execute threads of instructions; and a thread dispatcher coupled with the execution circuit and at least one additional execution circuit to dispatch threads for execution by selected execution circuits.

25. It would have been obvious to one of ordinary skill in the art, at the time of the invention to add one additional execution circuit to execute threads of instructions and a thread dispatcher. It is well known in the art to add additional execution units to increase processing capability of processors.

26. Regarding claim 13, Wenniger teaches that the execution circuitry, in response to receiving the semaphore acknowledge message, resumes execution of the thread of instructions including accessing the resource associated with the semaphore (col 6 lines 12-22).

27. Regarding claim 14, Wenniger teaches that when the thread of instructions is in the inactive state, execution of the instructions ceases and the execution circuitry does not poll the semaphore entity to determine a status of the semaphore request message (col 6 lines 6-12).

28. Regarding claims 15-18, they are the system claims of claims 11-14 above. Therefore, they are rejected for the same reasons as claims 11-14 above.

29. Claims 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang et al. (US Pat No. 5,771,382) in view of Winkeler et al. (US Pat No. 7,237,013).

30. Regarding claim 19, Wang does not teach placing requests for a semaphore in a queue.

31. However, Winkeler teaches a well known technique of creating a semaphore queue to queue pending requests (col 10 lines 39-47). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Wang to teach placing requests for a semaphore in a queue. One would be motivated by the desire to keep track of processes that desire access of the resource by queuing them.

32. Regarding claim 20, Wang teaches causing a thread to release a semaphore when use of a resource is completed (col 6 lines 63-65).

33. Regarding claim 21, Winkeler teaches automatically granting the resource to the thread whose request is the next request in the queue (col 10 lines 45-47, wherein each component can obtain the lock "in turn").

Response to Arguments

34. Applicant's arguments with respect to claim 1 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

35. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric C. Wai whose telephone number is 571-270-1012. The examiner can normally be reached on Mon-Thurs, 9am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng - Ai An can be reached on 571-272-3756. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Meng-Ai An/

/Eric C Wai/

Application/Control Number: 10/750,583

Page 11

Art Unit: 2195

Supervisory Patent Examiner, Art Unit 2195

Examiner, Art Unit 2195